The two enlarged spectra exhibited were taken on February 27 and March 3. In extent, they reach from (Hζ) to the position of the (*b*) line of magnesium. Comparison spectra of *Sirius* and β *Crucis* are mounted on the same plate. The hydrogen series are at once identified in the spectrum of *Nova*. They appear both as ill-defined absorption lines and as broad bright bands, displaced towards the red, but joining up to the dark lines.

The helium series of lines do not appear with any certainty either as bright or as dark lines or bands.

The calcium (K) line is present, and there are other absorption bands which appear to be partly due to calcium and titanium There are also other indistinct bright bands which have not been identified.

On the second photograph, taken on March 3, when the star had diminished somewhat in brightness, the spectrum remains the same, except that some of the dark bands have become more prominent.

The comparison with the spectrum of *Sirius* shows a certain correspondence between the grouping of the absorption lines in that spectrum and the dark bands in the spectrum of *Nova*. The correspondence is far from clear, but it is sufficient to suggest the idea that *Nova* is a Sirian star with additional bright bands due in the main to hydrogen. The displacement of the bright hydrogen bands to the less refrangible side of the absorption lines and their great width is attributed to differences of velocity in the line of sight between two or more sources of light. It should be observed, however, that in the case of *Nova Aurigæ* the bright bands were displaced in the same direction. No definite observations on this point appear to have been made with regard to *Nova Cygni* or *Nova Coronæ*. If the displacement is to be accounted for by differences of velocity, it should be as often one way as the other.

I hope to obtain some further photographs of the spectrum of *Nova* before it disappears, and will then place the full series before the Society.

1901 *March* 8.

Notes on the Spectrum of Nova Persei observed at the Stonyhurst College Observatory.

By the Rev. Walter Sidgreaves, S.J.

On the night of February 28 the cloud-cover, which had been persistent since the 20th, suddenly thinned at 10·15 P.M. to a hazy clearness. The *Nova* appeared rather brighter than α *Persei*. The spectrum was observed with the direct vision spectroscope on the 15-inch O.G. equatorial, and two photographs were obtained, one with this spectroscope, the other with a 4-inch

objective prism of $22\frac{1}{2}°$ refractive angle, by Mr. Thorp of Manchester, mounted on the Cooke finder of nearly 4 inches aperture.

The following notes refer mostly to the latter photograph, and to another taken with the same prism on March 3, when the star was rather fainter than *Algol*, but the sky much clearer between passing clouds. The plates were Mawson Stellar Rapid, and the one used with the direct compound prism an Edwards Isochromatic.

1. *The continuous spectrum* of the *Nova* is remarkable for its strength in the ultra-violet beyond the hydrogen series. The relative intensity here is such that if the rest of the spectrum were in accord with the sensibility curve of the plate, the blue region should be represented by a silver deposit darker than the darkest bands between Hβ and Hγ. This of itself would suggest that the dark bands of the negative between the hydrogen lines are not radiation lines, and that the spaces between them are absorption lines. But there is conclusive evidence on the plates that this is not the true interpretation of the spectrum. The continuity of the spectrum can be traced all along the photographs; and the region near Hβ on the violet side removes all doubt: this is undoubtedly continuous spectrum, and the silver density is quite in keeping with the paler spaces up to the Hθ, where it ceases to fade as rapidly as in other photographs of both white and yellow stars.

2. *The hydrogen lines* are very brilliant and very broad. The first three were easily seen on both dates without the aid of a cylindrical lens, Hα attracting the eye immediately. On the photographic plates Hβ is very intense, and the intensity of the others decreases in succession up to Hζ inclusive. Hη is nearly as strong as Hζ, while Hθ and Hι are much weaker and equal. Hι is the last of the series, although the continuous spectrum is very distinct considerably beyond this position. There are, however, two exceedingly feeble bright bands near, but the spaces between are nearer the positions of Hκ and Hλ.

Hβ, Hγ, Hδ, and Hη have certainly absorption companions on their violet sides. They are narrow compared with the bright lines. The apparent absorptions near the other lines may be mere contrast effects, but on the enlarged positive they look like decided absorptions.

The first four hydrogen bright lines β, γ, δ, and ϵ are sharper on their violet sides, and shade off towards the red side. Hη has the same appearance; but I think this line must be superposed on another bright band: it is out of proportion in breadth if the shading wing be considered part of the same line.

Hβ, Hδ, and Hζ, are each divided by a fine absorption line nearly central, and Hγ is probably divided in the same way.

The other bright lines of the spectrum are broad like the hydrogen lines. There are three very prominent ones besides narrower lines between D and F on the Isochromatic plate; and

on the Mawson plate there are four between Hβ and Hγ, and four also between Hγ and Hδ, one of which adjoins Hδ; and one, the calcium line K, between Hι and Hζ.

The Isochromatic plate was exposed under rather worse atmospheric condition: the haze was thickening, and the star low down. The photograph is weak and the definition not good. But the positions of 14 lines were found to agree closely with those of *Nova Aurigæ* in 1892 February. The λ curve for the objective prism has not yet been plotted.

On the New Star in Perseus. By A. Stanley Williams.

A photograph of the region including *Nova Persei* was obtained here on the night of February 20 with a 4·4-inch Grubb portrait lens, and an exposure of 47 minutes (1901 February 20, $10^h\ 40^m$ to $11^h\ 27^m$ Greenwich mean time). There is no certain trace of the *Nova* visible upon this plate, which shows distinctly stars down to about the 12th magnitude, so that it must have been fainter than this at the time the photograph was taken. When discovered by Dr. Anderson on February 21 at $14^h\ 40^m$, the star had already attained a magnitude of 2·7, so that in an interval of not more, and probably less, than 28 hours a rise of about $9\frac{1}{2}$ magnitudes at least must have occurred.

Similar photographs were obtained on 1901 January 15 and 25 and February 11, on none of which is any certain trace of the star to be seen. There are two or three very minute stars visible near its place, but none of them appear to occupy exactly the same position.

The following eye-estimates of the brightness of the *Nova* were made by the writer.

1901 February 25, $11\frac{1}{2}^h$, *Nova* about midway between *Capella* and *a Persei*, but sky never perfectly clear.

	h	
Feb. 26	$11\frac{1}{2}$	3 steps brighter than *a Persei*
Feb. 28	10	3 steps brighter than *a Persei*
Mar. 1	$9\frac{1}{2}$	5 steps fainter than *a Persei*
Mar. 1	12	7 steps fainter than *a Persei*
Mar. 3	7 10^m	6 steps below *a Persei*, 2 steps below *β Persei*, 10 steps above *δ Persei*

In all these observations there was a bright Moon. On March 1 the *Nova* was also thought to be about equal to *Algol*, but comparison was unsatisfactory, owing to the difference in the colours of the two stars. Adopting the H.P. magnitudes of the comparison stars, and assuming the value of a step to be 0·1 mag-